DRAFT

Black Sand Removal Action Work Plan

Crawford Street Site
Portland, Oregon

Prepared for
Crawford Street Corporation

August 28, 2001

BRIDGEWATER GROUP, INC.

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4500 SW Kruse Way; Suite 110
LAKE OSWEGO, OR 97035
TEL: (503) 675-5252
FAX: (503) 675-1960
rrieke@bridgeh2o.com

August 30, 2001

Mr. Tom Gainer
Oregon Department of Environmental Quality
2020 SW Fourth Ave., Suite 400
Portland, OR 97201-4987

Subject: Crawford Street Corporation Site
Draft Black Sand Removal Action Plan

Please find enclosed three copies of the August 28, 2001, *Draft Black Sand Removal Action Work Plan, Crawford Street Corporation Site*. We look forward to your comments as we move forward to remove the black sand this early fall before the river levels rise. We will be submitting the Corps of Engineers/Oregon Division of State Lands joint permit application in the next few days. We appreciate your continued assistance in obtaining these permits.

Please call if you have any questions.

Sincerely,

BRIDGEWATER GROUP, INC.

Ross D. Rieke, P.E.
Vice President
Environmental Consultant

Encl.

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SECTION 1

INTRODUCTION AND PROJECT BACKGROUND

This Black Sand Removal Action Work Plan (Work Plan) presents the procedures and processes that will be used to perform the black sand removal action at the Crawford Street site in Portland, Oregon (Figure 1-1).

This Work Plan has been prepared under the oversight of the Oregon Department of Environmental Quality (DEQ).

1.1 Site and Project Description

1.1.1 Site Description

The Crawford Street site is located between North Burlington and North Richmond Streets in north Portland and is bordered by North Crawford Street and the Willamette River (Figure 1-2). The portion of the overall site where the black sand removal work will occur (i.e. the "Site") is in the southwest corner of the Crawford Street site, near the Willamette River. The Site includes an area on the beach of the Willamette River and along the top edge of the bank, above the beach. The Site is currently vacant except for a chain-link fence located along the top of the bank.

The beach portion of the Site is unvegetated sand with scattered woody debris (i.e. logs, sticks) and concrete debris. Scattered trees and shrubs are present along the slope and top of the bank. The beach lies below the typical water level and is typically submerged.

Ordinary high water (about elevation 16 ft NGVD) corresponds to the middle portion of the bank. The top of the bank is at about elevation 30 feet. The bank lies at an approximate 4H:3V slope at the Site. The Willamette River is currently at historically low levels. During high tide, the river level is at about elevation 4 ft (NGVD) and at low tide the river is at about 1 ft (NGVD). Figure 1-4 shows a typical cross section of the beach and adjacent bank.

1.1.2 Site History and Project Description

In October 1999, DEQ requested that Crawford Street Corporation (CSC) perform a Preliminary Assessment at the Crawford Street site. DEQ further requested that the PA include soil and groundwater sampling and analysis. The PA was completed and soil and groundwater samples were collected and analyzed in early 2001.

The results of the PA sampling and analysis indicated elevated concentrations of hazardous substances in black sand found on the Site. In particular, black sand was found along a limited portion of the Willamette River beach and along the top of bank above the beach. DEQ determined that possible releases of hazardous substances from the black sand in these areas could potentially migrate to the Willamette River and pose a threat to ecological receptors in the river.

On August 28, 2001, DEQ issued a letter to CSC requesting that CSC remove the black sand from the beach and from along the top of the adjacent bank to prevent potential future migration of hazardous substances from the black sand to the river. A copy of the letter is provided in Appendix A of this Work Plan. Bridgewater Group, on behalf of CSC prepared this Work Plan to guide the black sand removal action work.

1.2 Nature and Extent of Black Sand

1.2.1 Extent of Black Sand

Black sand is visually apparent on the ground surface in two areas of the Site; along an approximate 150-foot length of beach and along an approximate 150-foot length of the top edge of the bank above the beach area. Figure 1-3 shows the extent of the black sand in these two areas of the Site. The depth of the black sand in these two areas is about 1 to 2 feet. Figure 1-4 shows a schematic cross-section of the Site with the location and relative elevation of the black sand areas.

The black sand on the beach is at an elevation of about 6 feet. This elevation is well below the typical water level but is above the current, historically low, river level.

1.2.2 Chemical Analysis of Black Sand Samples

Samples of the black sand have been collected from along the beach and the bank. The samples have been analyzed for:

- Petroleum hydrocarbons
- Polycyclic aromatic hydrocarbons (PAHs)
- Polychlorinated biphenyls (PCBs)
- Total metals
- TCLP metals

Tables 1-1, 1-2, 1-3, and 1-4 present the results of the chemical analyses of the black sand. As shown on Tables 1-2 and 1-3, concentrations of PAHs, PCBs, and metals (nickel, copper, zinc, lead, and chromium) greater than ecological screening concentrations (i.e. McDonald

Consensus Threshold Effects Concentrations or TECs) have been measured in the black sand.

TCLP lead concentrations in a few of the black sand samples were measured to be greater than 5 mg/l. As a result, excavated black sand is a characteristic hazardous waste and is subject to hazardous waste management requirements.

SECTION 2

BLACK SAND REMOVAL ACTIVITIES

This section describes the specific tasks that will be performed to complete the black sand removal action work.

2.1 Pre Construction Permitting and Reviews

Several permits and government agency reviews are required before the field activities can be initiated. Specific permits are required from the U.S. Army Corps of Engineers (COE) and the Oregon Division of State Lands (DSL). A City of Portland Greenway Review is also required from the City of Portland planning department. All necessary permits and reviews will be obtained and completed prior to starting the removal action field work.

The DEQ cleanup regulations exempt DEQ-approved cleanup actions, such as the black sand removal action, from local and state permits, including the City of Portland fill and grading permit. However, the removal action is subject to the substantive requirements of the City permit. The erosion control procedures and other site controls that will be implemented during the removal action meet the substantive requirements of the City fill and grading permit.

Current Oregon DEQ regulations require that construction projects that disturb five or more acres are subject to an NPDES Stormwater Discharge General Permit # 1200-C. The area of the removal action is less than 5 acres. Thus, an NPDES permit is not required for the black sand removal work.

2.2 Black Sand Removal Activities

2.2.1 Contractor Mobilization

The contractor will mobilize the necessary equipment to the site. Necessary equipment is anticipated to include:

- Track-hoe excavator or backhoe
- Front end loader
- High capacity vacuum truck
- Small dump truck
- Water truck
- Support vehicles and equipment

The contractor will also mobilize temporary toilet facilities to the site.

2.2.2 Site Layout

The contractor will temporarily remove the existing fence, as necessary to facilitate the soil excavation, hauling, and grading work. The fencing materials may be saved and reused to reconstruct the fence at the conclusion of the removal work. The contractor will establish the exclusion zone as described in Section 2.3.1 prior to starting the removal work.

The black sand removal areas will be marked in the field prior to the start of the initial excavations. The contractor will locate buried utilities in the project area prior to starting the excavation work.

2.2.3 Remove Black Sand from Beach

The area of the black sand that will be removed from the beach is shown in Figure 1-3. The black sand will be removed from the beach area using a high-capacity vacuum truck. The truck will be parked along the top of the bank, above the beach removal area. No large equipment will be placed on the beach.

The nominal 6-inch diameter vacuum hose will be extended down the bank to the beach. Two workers will manually move the end of the hose around the beach removal area, sucking the black sand up the hose and into the truck.

The workers will remove the black sand from around and beneath the large debris present on the beach as practicable with the vacuum hose. Large wood and concrete debris will not be moved. The workers will not disturb the limited vegetation that is present in black sand area on the beach. The workers will not remove beach material closer to the water than the limits of the black sand area shown on Figure 2. Although the workers may walk in the area between the removal area and the water, no major removal activities will occur in this area.

Based on the beach area shown in Figure 1-3 and the apparent black sand depth of about 1 to 2 feet, a total of about 150 cubic yards of black sand are anticipated to be removed from the beach area. This estimated volume includes some contingency for additional black sand discovered beyond the boundaries shown in Figure 1-3.

2.2.4 Remove Black Sand from Edge of Bank

Black sand present along the edge of the top of the bank will be removed to prevent future possible sloughing during anticipated future high water conditions. The area of the bank edge removal is shown in Figure 1-3. The black sand will be removed back from the bank edge a minimum distance of 10 feet. The material will be removed using either a high-capacity vacuum truck or an excavator. Approximately 150 cubic yards of black sand are anticipated to be removed from the bank edge.

Small vegetation and debris present in the bank edge black sand area will be removed as necessary prior to starting the excavation work. Large trees will not be removed.

2.2.5 Temporary Stockpile Excavated Black Sand

The removed black sand will be hauled from the top of the bank and placed in temporary stockpiles located in the area shown on Figure 1-2. The material will be stored in the stockpiles until final disposition of the black sand is determined.

The stockpiles will be placed on a minimum 12-mil-thick plastic to prevent contact between the stockpiled material and the underlying existing ground surface. The existing ground surface will be cleared of debris and sharp objects prior to the liner being placed.

The stockpiles will be bermed and covered to prevent run-on and runoff and to prevent wind erosion. The stockpile areas will be fenced with a temporary fence to discourage unauthorized access to the stockpiles.

The run-on and run-off control, covering, liner beneath the stockpile area, and surrounding fence meets the substantive technical requirements for hazardous waste piles presented in 40CFR 265.250. DEQ cleanup regulations exempt the stockpile from hazardous waste storage permit requirements.

2.2.6 Post-Removal Sampling and Analysis

Soil samples will be collected from the bottom and sidewalls of the black sand removal excavations to assess the effectiveness of the removal action.

One sidewall soil sample will be collected every 20 feet of excavation perimeter. Each sidewall surface soil sample will be collected by compositing a minimum of three subsamples from representative sublengths along the perimeter sampling length. The subsamples will be collected from across the depth of the excavation. If discrete zones of soil with field evidence indicating significantly greater contamination than surrounding soil are observed around the excavation perimeter, sidewall soil samples will also be collected from the observed area.

One excavation bottom sample will be collected for every 400 square feet of excavation bottom area. Each bottom sample will be collected from its associated bottom area by compositing a minimum of five subsamples from representative subareas within the bottom sampling area.

The post removal soil samples will be analyzed for the following:

- PAHs using EPA Method 8310 or 8270SIM.
- PCBs using EPA Method 8082.
- Total nickel, zinc, chromium, copper, and lead using EPA Method 6000 series.

If concentrations of lead are measured in excess of 100 mg/kg, the samples will be analyzed for TCLP lead by EPA Method 1311/601.

The samples will be collected with clean sampling equipment using standard environmental sampling protocols. Sample chain of custody will be maintained at all times and samples will be transported to the analytical laboratory daily.

The laboratory analyses will be performed on a rapid turnaround and the appropriateness of additional removal work will be assessed and discussed with DEQ.

2.2.7 Backfill and Revegetate Removal Areas

2.2.7.1 Beach Removal Area

The beach removal area will not be backfilled. The edges of the removal area will be hand graded to prevent tripping hazards until the river levels rise to normal levels above the beach removal area.

2.2.7.2 Bank Edge Removal Area

Clean, import backfill will be placed in the bank edge removal area after the black sand has been removed. The backfill will be graded to discourage surface water runoff from the uplands down the bank.

Representative samples of the import material will be collected at a frequency of one sample for every 100 yards of material, and will be analyzed for petroleum hydrocarbons, PCBs, and metals to confirm the lack of elevated concentrations of hazardous substances.

Once the bank edge area has been backfilled, the disturbed removal area will be revegetated with native plant species including alder and ash trees and native grasses. Straw bales, long-term silt fencing, and seed mat will be used as necessary to prevent soil erosion while vegetation is being established.

2.2.8 Contractor Demobilization

At the conclusion of the field activities, the contractor will demobilize all equipment and supplies from the site. Equipment used in the exclusion zone will be decontaminated in accordance with the procedures discussed in Section 2.3.2 prior to demobilization. All wastes, trash, and construction materials will be removed.

2.3 Site Control Measures

Several site control measures will be implemented during the field activities to prevent impacts to nearby areas and workers.

2.3.1 Prevention of Offsite Impacts

The following control measures will be implemented to prevent impacts to the Willamette River and other surrounding areas:

- A silt fence will be placed along river between the waterline and the beach removal area.
- No removal activities will be allowed within 20 feet of waterline.
- Disturbance of vegetation along the top of bank will be minimized and only as necessary to remove black sand.
- Woody debris will be left along bank and beach.
- Work will be performed during dry weather conditions to prevent surface water runoff to river.
- The onsite truck haul routes (e.g. from the bank edge to the stockpile area) will be watered as necessary to prevent visible dust. Watering will be limited to prevent ponding or runoff of water. Trucks will be loaded in a manner that prevents spillage.
- Stockpiles will be lined, bermed, and covered to prevent run-on and runoff.
- The work will be performed during low tide conditions, as practicable, to reduce the potential for run off to the river.

The erosion and sediment control features described above will remain in place until the bank edge is sufficiently vegetated such that erosion will not occur under typical rainfall events.

Any spills of hazardous substances from the equipment will be immediately cleaned up and runoff from the spill area prevented until the cleanup is completed.

Based on the type and concentrations of hazardous substances in the black sand, odor control is not anticipated to be necessary.

2.3.2 Personnel and Equipment Decontamination

An exclusion zone will be established around the removal areas, the onsite haul routes, and the temporary stockpile areas. Excavation equipment and personnel will be allowed to freely move within the exclusion zones without decontamination. The equipment will be allowed to move between separate exclusion zones with decontamination consisting of brooming of loose soil and removal of significant quantities of adhered soil with hand tools.

Any equipment exiting the exclusion zone and leaving the site will be washed as necessary to remove all contaminated soil. A temporary decontamination area will be constructed inside the exclusion zone to contain these activities. Decontamination fluids will be collected and properly disposed.

Personnel exiting the exclusion zone will decontaminate themselves according to the decontamination procedures specified in the health and safety plan.

2.3.3 Site Security

Site security will be provided by a combination of the existing fence and an additional, temporary fence around exclusion areas. Security around the temporary stockpiles will be provided by the temporary fence.

2.4 Health and Safety

CSC will develop a health and safety plan for its employees and subcontractors. The contractor will be required to develop a separate health and safety plan for its employees. The contractor will submit their health and safety plan to CSC for review along with records that demonstrate that its onsite personnel have current appropriate training. This information will be submitted no later than two weeks prior to beginning fieldwork. The contractor will be responsible for the overall health and safety at the site.

SECTION 3

DOCUMENTATION OF REMOVAL ACTIVITIES

3.1 Removal Action Field QA/QC Activities

CSC will perform a field QA/QC program to ensure that the removal action field work is performed in accordance with this Work Plan. A soil sampling and analysis program will be implemented to assess the effectiveness of the removal action.

The specific removal action field QA/QC activities include the following:

- Sampling and analysis of excavation sidewalls and floors.
- Sampling and analysis of import backfill material (one sample per each 100 cubic yard of import soil).
- Field duplicate sampling and analysis on a 5 percent basis.
- Laboratory QA/QC, including duplicate, spikes, spike duplicates, and surrogate analyses.

These activities provide adequate assessment of the removal action work.

All site features that protect against hazardous substance releases will be inspected daily during the field removal work. These are:

- Erosion and sediment control features, including berms and silt fences.
- Fences and gates.
- Stockpile covers and visible portion of bottom liners.

These daily inspections will be documented in the daily notes maintained by the CSC field representative. Actions to correct any identified deficiencies also will be documented in the field notebooks.

3.2 Field Documentation

CSC field representatives will use a project notebook to record pertinent field information and describe sampling procedures. Entries will be sufficiently detailed to allow reconstruction of the sampling events. The following site activity information will be recorded in the project notebook:

- Time of arrival and departure from the site.
- Project personnel and subcontractor personnel onsite.
- Equipment calibration records.

- All sample locations, designations, and information.
- Health and safety monitoring records.
- Contractor pay and time quantities; downtime; and equipment breakage.
- Equipment present and equipment used.
- Visitor names, association, and purpose of visit.

Sampling locations, sampling procedures and significant findings will be photographed. Each photograph will be logged in a project notebook.

3.3 Report

At the conclusion of the removal action field activities, CSC will prepare a black sand removal action report that summarizes and documents the removal action field activities. The report will include:

- Figures showing the final lateral and vertical extent of all black sand excavations.
- Total in-place volume of soil removed from the beach and from the edge of the bank.
- Figures and tables showing the results of all sampling and analysis performed during the removal action.
- Descriptions of the specific field activities and conditions including onsite material management, excavation conditions, unusual or unanticipated conditions or events.
- Copies of daily reports and other field documentation.
- Copies of analytical laboratory reports.
- Representative photographs showing the site mobilization, black sand removal, temporary stockpile preparation, site rehabilitation, and sampling activities.

A draft report will be prepared for DEQ review. Upon receipt of DEQ's comments, a final removal action report will be prepared.

SECTION 4

ROLES AND RESPONSIBILITIES OF REMOVAL ACTION TEAM

The black sand removal action team consists of the following primary parties:

- Crawford Street Corporation
- Bridgewater Group
- Oregon Department of Environmental Quality
- Removal Action Environmental Contractor

Each of these team member's roles and responsibilities are described below.

4.1 Crawford Street Corporation

Crawford Street Corporation (CSC) is the owner of the site and the party performing the removal action. CSC is responsible for providing access to the site. CSC will be considered the generator of all wastes generated during the removal action. Mat Cusma (503-286-6944), an environmental associate with CSC, is the project coordinator for CSC and will be the primary administrative contact with DEQ during the removal action.

4.2 Bridgewater Group

Bridgewater Group is the CSC environmental consultant for the black sand removal action project. Bridgewater Group is responsible for performing the technical analyses, preparing all plans and reports, documenting the removal action activities, performing construction QA/QC, and performing required sampling and analysis. Ross Rieke (503-675-5252) is the project manager for Bridgewater Group and will be the primary technical contact with DEQ during the removal action.

4.3 Oregon Department of Environmental Quality

DEQ will provide review and comment during the black sand removal action project. In particular, DEQ will review and approve the removal action work plan and the removal action report and will provide oversight during the field activities. DEQ will be responsible for performing the public involvement program for the removal action and will be the primary point of contact for the public during the removal action. All inquiries from

the public will be directed to DEQ. Tom Gainer (503-229-5326) is the project manager for DEQ.

4.4 Removal Action Environmental Contractor

The black sand removal action environmental contractor (contractor) will be responsible for performing all field construction activities. These activities will include soil excavation, onsite management, grading, loading, and hauling. The contractor will also be responsible for implementation of site controls and site safety during the field construction work. The contractor will contract directly with CSC.

SECTION 5

PROJECT SCHEDULE

The overall black sand removal action field work is anticipated to require about 2 to 3 days, including mobilization, stockpile area preparation, and demobilization. The removal action in the beach area is anticipated to be completed in less than one day.

The field work is anticipated to begin in late September or early October, before the river level begins to rise. The field activities will be performed only during the hours of 7AM to 7PM.

Table 1-1
Detected Chemical Concentrations in Black Sand
Petroleum Hydrocarbons
Crawford Street
All results in mg/kg

Sample	Location	Date	Sample Depth (ft)	Gasoline	Diesel	Heavy oil
SS-05	Black sand - shoreline	4/24/2001	0.5	4 U	25 U	50 U
SS-10	Black sand - bank	4/26/2001	2.0	4 U	78.3	180
SS-08	Pipe outfall (black sand area)	4/24/2001	0.5	4 U	25 U	194
BS-1A	Black sand - shoreline	6/22/2001	0.5	NA	NA	NA
BS-1B	Black sand - shoreline	6/22/2001	0.5	NA	NA	NA
BS-1C	Black sand - shoreline	6/22/2001	0.5	NA	NA	NA
BS-1D	Black sand - shoreline	6/22/2001	0.5	NA	NA	NA
CS-1	Black sand - shoreline	7/17/2001	0.5	NA	NA	NA
CS-2	Black sand - shoreline	7/17/2001	0.5	NA	NA	NA
CS-3	Black sand - shoreline	7/17/2001	0.5	NA	NA	NA
CS-4	Black sand - shoreline	7/17/2001	0.5	NA	NA	NA

U - Not detected at noted reporting limit
NA - Not analyzed

Table 1-2
Detected Chemical Concentrations in Black Sand
PAHs and PCBs
Crawford Street
All results in mg/kg

Sample	Location	Date	Sample Depth (ft)	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracer	Benzo(a)pyrene	Benzo(b)fluoranth	Benzo(g,h,i)peryle	Benzo(k)fluoranth	Chrysene	Dibenzo(a,h)anthr	Fluoranthene	Fluorene	Indeno(1,2,3-cd)py	Naphthalene	Phenanthrene	Pyrene	LPAHs	HPAHs	Total PAHs	PCBs
SS-05	Black sand - shoreline	4/24/2001	0.5	0.067 U	0.067 U	0.067 U	0.0683	0.0828	0.0811	0.0742	0.072	0.084	0.067 U	0.144	0.067 U	0.067 U	0.067 U	0.168	0.127	0.168	0.901	1.069	0.224
SS-10	Black sand - bank	4/26/2001	2.0	0.096	0.67 U	0.192	0.498	0.768	0.728	0.573	0.682	0.632	0.168	0.927	0.100	0.515	0.067 U	0.658	0.742	1.046	6.233	7.279	1.11
SS-08	Pipe outfall (black sand area)	4/24/2001	0.5	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	NA	NA	NA	NA
BS-1A	Black sand - shoreline	6/22/2001	0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BS-1B	Black sand - shoreline	6/22/2001	0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BS-1C	Black sand - shoreline	6/22/2001	0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BS-1D	Black sand - shoreline	6/22/2001	0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CS-1	Black sand - shoreline	7/17/2001	0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CS-2	Black sand - shoreline	7/17/2001	0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CS-3	Black sand - shoreline	7/17/2001	0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
CS-4	Black sand - shoreline	7/17/2001	0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
McDonald Consensus TECs (sediment)						0.0572	0.108	0.15				0.166	0.033	0.423	0.077		0.176	0.204	0.195			1.61	0.06

U - Not detected at noted reporting limit
NA - Not analyzed

Table 1-3
Detected Chemical Concentrations in Black Sand
Metals
Crawford Street
All results in mg/kg

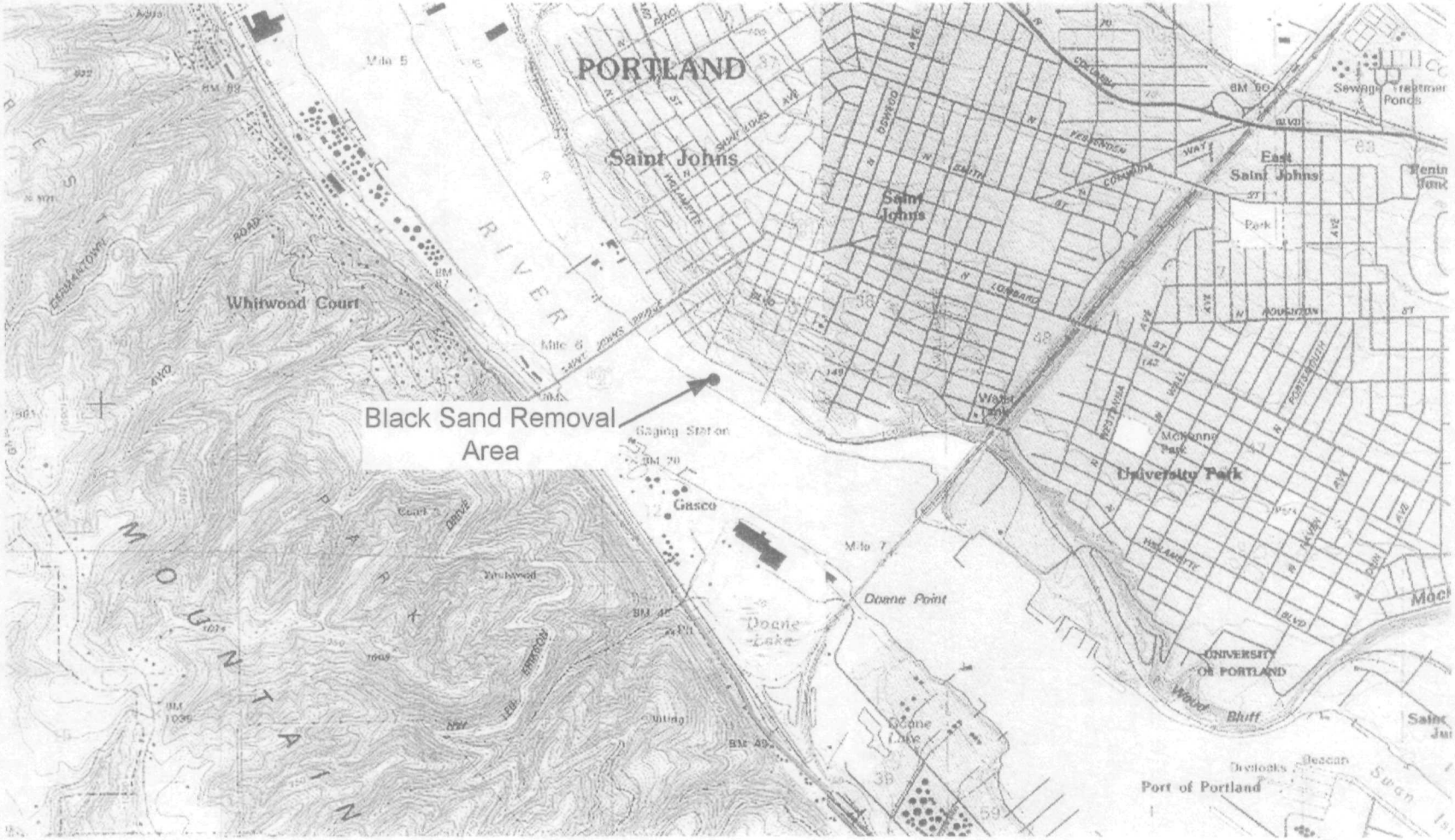
Sample	Location	Date	Sample Depth (ft)	Antimony	Arsenic	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Zinc
SS-05	Black sand - shoreline	4/24/2001	0.5	NA	NA	NA	0.5 U	202	NA	65.3	0.1 U	NA	NA	NA	NA	NA
SS-10	Black sand - bank	4/26/2001	2.0	NA	NA	NA	0.5 U	174	NA	140	0.1 U	NA	NA	NA	NA	NA
SS-08	Pipe outfall (black sand area)	4/24/2001	0.5	0.5 U	5.65	0.5 U	0.5 U	69	170	45.6	0.167	29	0.503	0.5 U	0.5 U	178
BS-1A	Black sand - shoreline	6/22/2001	0.5	NA	NA	NA	NA	NA	NA	52.3	NA	NA	NA	NA	NA	NA
BS-1B	Black sand - shoreline	6/22/2001	0.5	NA	NA	NA	NA	NA	NA	58.9	NA	NA	NA	NA	NA	NA
BS-1C	Black sand - shoreline	6/22/2001	0.5	NA	NA	NA	NA	NA	NA	89	NA	NA	NA	NA	NA	NA
BS-1D	Black sand - shoreline	6/22/2001	0.5	NA	NA	NA	NA	NA	NA	558	NA	NA	NA	NA	NA	NA
CS-1	Black sand - shoreline	7/17/2001	0.5	NA	NA	NA	NA	NA	NA	42	NA	NA	NA	NA	NA	NA
CS-2	Black sand - shoreline	7/17/2001	0.5	NA	NA	NA	NA	NA	NA	28	NA	NA	NA	NA	NA	NA
CS-3	Black sand - shoreline	7/17/2001	0.5	NA	NA	NA	NA	NA	NA	2150	NA	NA	NA	NA	NA	NA
CS-4	Black sand - shoreline	7/17/2001	0.5	NA	NA	NA	NA	NA	NA	26	NA	NA	NA	NA	NA	NA
McDonald Consensus TECs (sediment)					9.79		0.99	43.4	31.6	35.8	0.18	22.7				121

U - Not detected at noted reporting limit
NA - Not analyzed

Table 1-4
Detected Chemical Concentrations in Black Sand
TCLP Metals
Crawford Street
All results in mg/l

Sample	Location	Date	Sample Depth (ft)	TCLP Arsenic	TCLP Cadmium	TCLP Chromium	TCLP Copper	TCLP Lead	TCLP Mercury	TCLP Nickel	TCLP Zinc
SS-05	Black sand - shoreline	4/24/2001	0.5	NA	NA	0.5 U	NA	7.39	NA	NA	NA
SS-10	Black sand - bank	4/26/2001	2.0	NA	NA	0.5	NA	1.1	NA	NA	NA
SS-08	Pipe outfall (black sand area)	4/24/2001	0.5	0.5 U	NA	0.5 U	0.5 U	0.5 U	0.0002 U	NA	1.45
BS-1A	Black sand - shoreline	6/22/2001	0.5	NA	NA	NA	NA	16.8	NA	NA	NA
BS-1B	Black sand - shoreline	6/22/2001	0.5	NA	NA	NA	NA	NA	NA	NA	NA
BS-1C	Black sand - shoreline	6/22/2001	0.5	NA	NA	NA	NA	NA	NA	NA	NA
BS-1D	Black sand - shoreline	6/22/2001	0.5	NA	NA	NA	NA	NA	NA	NA	NA
CS-1	Black sand - shoreline	7/17/2001	0.5	NA	NA	NA	NA	0.17	NA	NA	NA
CS-2	Black sand - shoreline	7/17/2001	0.5	NA	NA	NA	NA	0.3	NA	NA	NA
CS-3	Black sand - shoreline	7/17/2001	0.5	NA	NA	NA	NA	14.2	NA	NA	NA
CS-4	Black sand - shoreline	7/17/2001	0.5	NA	NA	NA	NA	0.23	NA	NA	NA

U - Not detected at noted reporting limit
NA - Not analyzed



N

Black Sand Removal Area at
45° 35' 3" N and 122° 45' 25" W

Approximate Scale

2400 feet

Figure 1-1
Site Location Map
Crawford Street Corporation Site

BRIDGEWATER GROUP, INC.

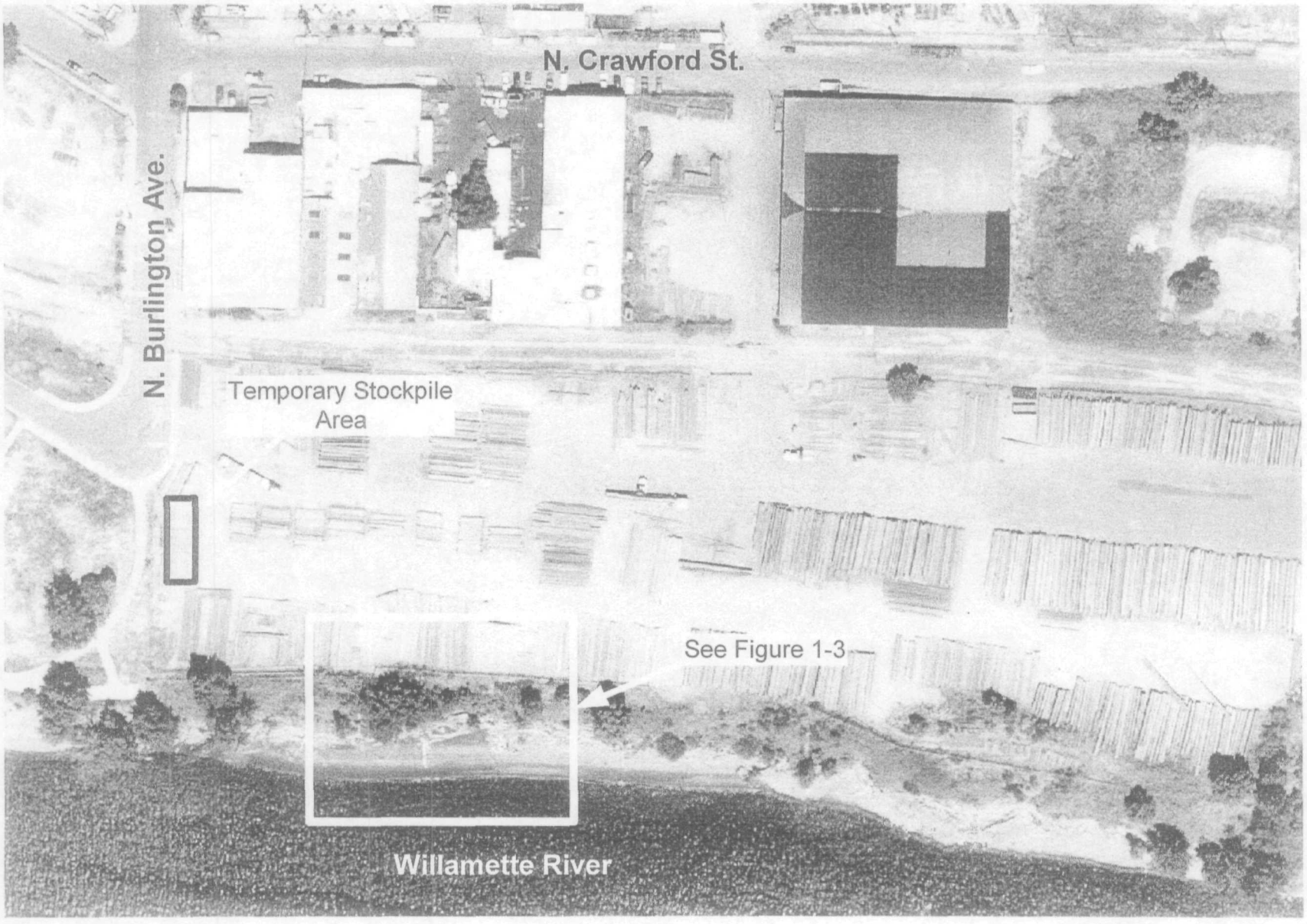
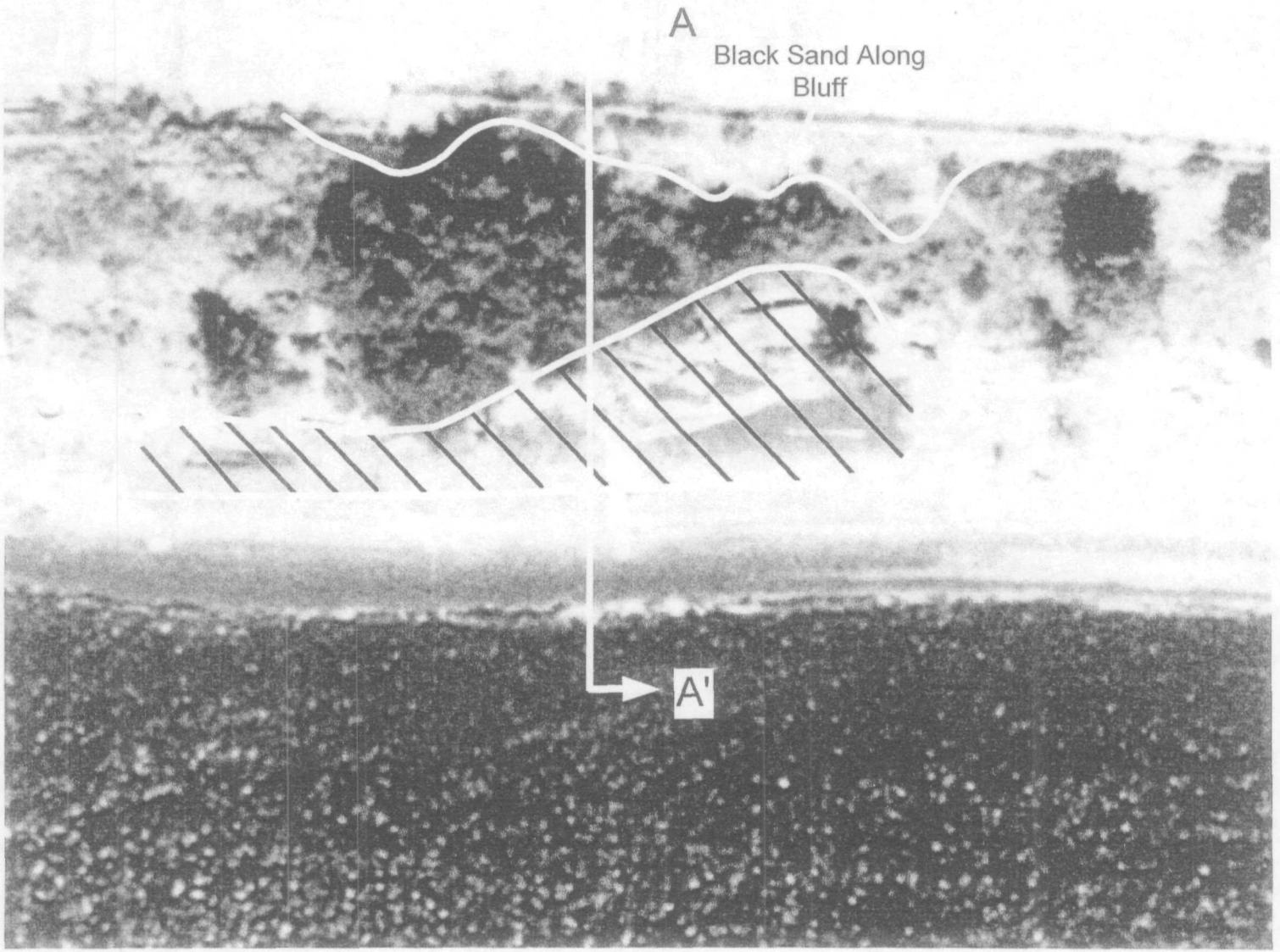


Figure 1-2
Site Plan
Crawford Street Corporation

BRIDGEWATER GROUP, INC.



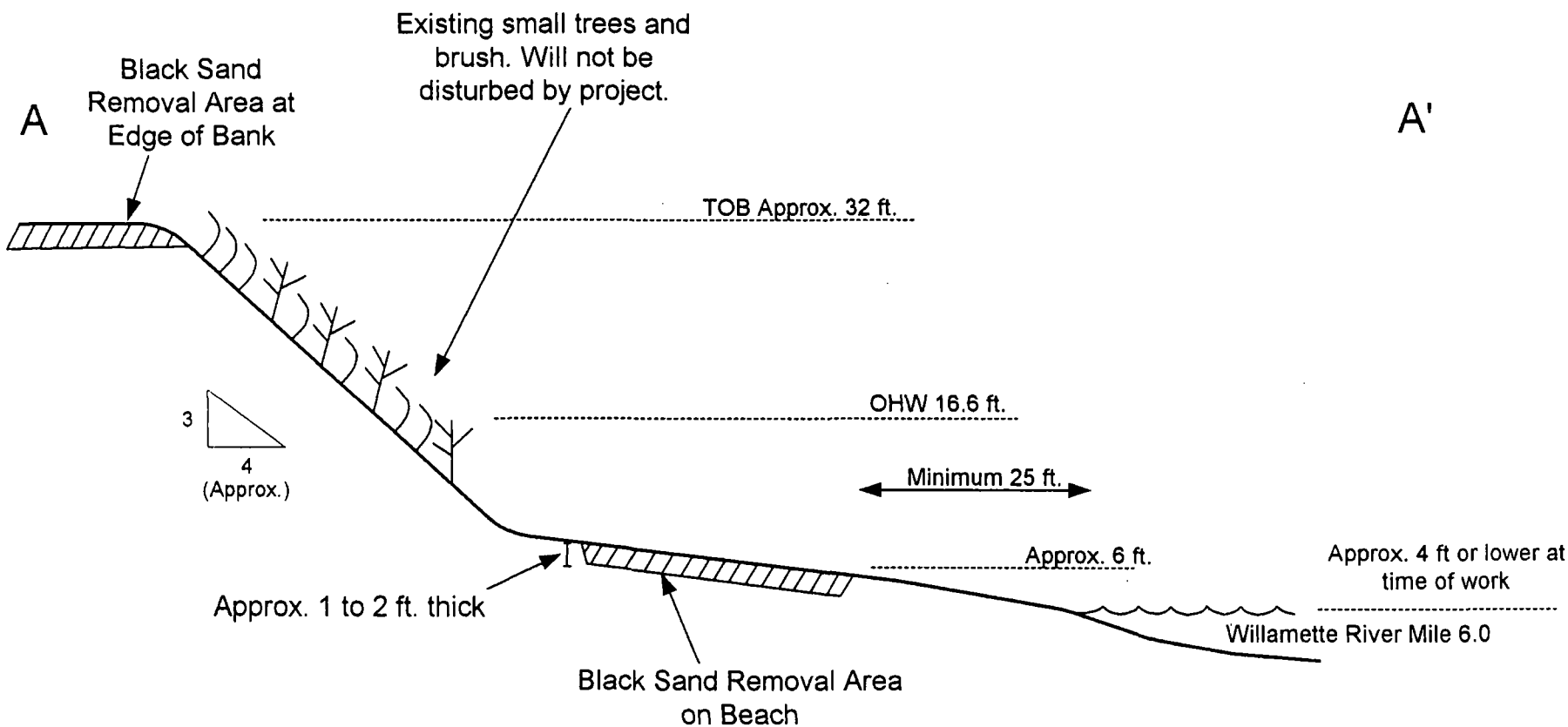
Approximate Scale

30 feet

Black Sand Removal Area
Approximately 1.5 feet deep

Figure 1-3
Black Sand Removal Areas
Crawford Street Corporation

BRIDGEWATER GROUP, INC.



Note: Figure Not Drawn to Scale

Elevations Based on NGVD

Figure 1-4
Cross Section A-A'
Crawford Street Corporation

BRIDGEWATER GROUP, INC.

APPENDIX A

DEQ LETTER REQUESTING BLACK SAND REMOVAL ACTION

Oregon
John A. Kitzhaber, M.D., Governor

Department of Environmental Quality
Northwest Region Portland Office
2020 SW 4th Avenue, Suite 400
Portland, OR 97201-4987
(503) 229-5263
FAX (503) 229-6945
TTY (503) 229-5471

August 28, 2001

Matt Cusma
Schnitzer Steel Industries
P.O. Box 10047
Portland, Oregon 97296-0047

RE: Black Sand Removal
Crawford Street Corporation Site
8424 and 8524 N. Crawford Street, Portland, Oregon

Dear Mr. Cusma:

Thank you for submitting the Conceptual Plan (attached) for removal of the black sand contamination documented as part of the Expanded Preliminary Assessment (XPA) of the above-referenced site. Elevated levels of polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls, and chromium, lead, and zinc were observed in the black sand, and are considered hazardous substances per ORS 465.200. Black sand delineated on the beach and the "bluff (top of bank)" is susceptible to erosion into the Willamette River or may be submerged during higher water levels than currently exist.

Based on contaminant concentrations in the black sand, the Department of Environmental Quality (DEQ) has determined that contaminant migration to the Willamette River from the black sand on the subject site may pose a threat to human health and the environment and warrants removal action measures (i.e., source control) under OAR 340-122-070. As a result, DEQ requires that Crawford Street Corporation take necessary black sand removal actions as described in the conceptual plan to mitigate the unacceptable risk.

Please call me if you have questions.

Sincerely,

Tom Gainer

Tom Gainer, P.E.
Project Manager
Voluntary Cleanup/Portland Harbor

Attachment

Draft Outline – Crawford Street Black Sand Removal Work Plan

Placement Area Preparation

Designate placement area at steel storage pads in western portion of yard. Area of existing inferred upland black sand location.

Prepare upland area by moving steel and excavating 1 to 2 foot-deep pits. Excavate no deeper than existing black sand.

Stockpile clean gravel for subsequent reuse.

Bench test of stabilization mixture.

Remove Black Sand from Beach

Remove black sand from beach using high-capacity vacuum truck.

Estimated volume of 150 cubic yards based on 1.5 feet thick with contingency.

Remove as practical from beneath large debris. Avoid mobilizing large equipment necessary to move large debris on beach.

No backfill. Hand grade to remove tripping hazards.

Remove from Edge of Bank

Prevent future sloughing during high water.

Remove with vacuum truck or excavator.

Estimate about 150 cubic yards.

Remove small vegetation and debris as necessary before starting excavation. Avoid damaging trees.

Remove to north such that at least 10 feet from black sand to edge of bank and 1-foot cover over black sand.

Place cover of clean soil to bank edge. Sample import backfill material to ensure no contamination.

Vegetate soil cover with shrubs and small trees. Straw bales, long-term silt fencing, seed mat as necessary to ensure erosion control to river.

Placement and Sampling of Black Sand

Spread black sand on upland pad area.

Stabilize with 10 to 15 percent Portland cement mixture.

Sample after stabilization to confirm protective of workers (PAHs, PCBs), protective of groundwater (TCLP metals), and below hazardous waste criteria (TCLP lead).

Place 1-ft cover of clean gravel over stabilized black sand.

Replace steel on pad areas.

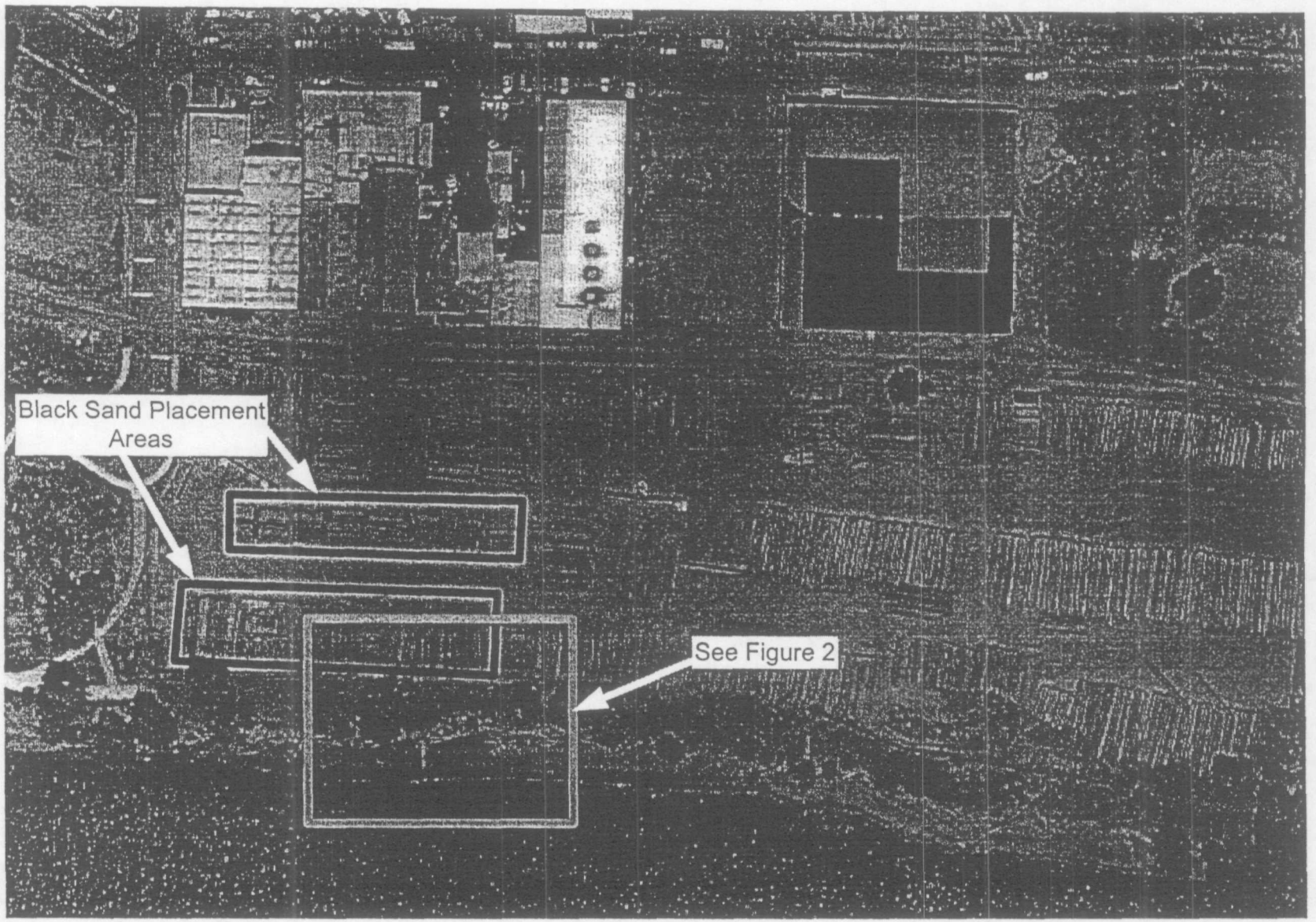
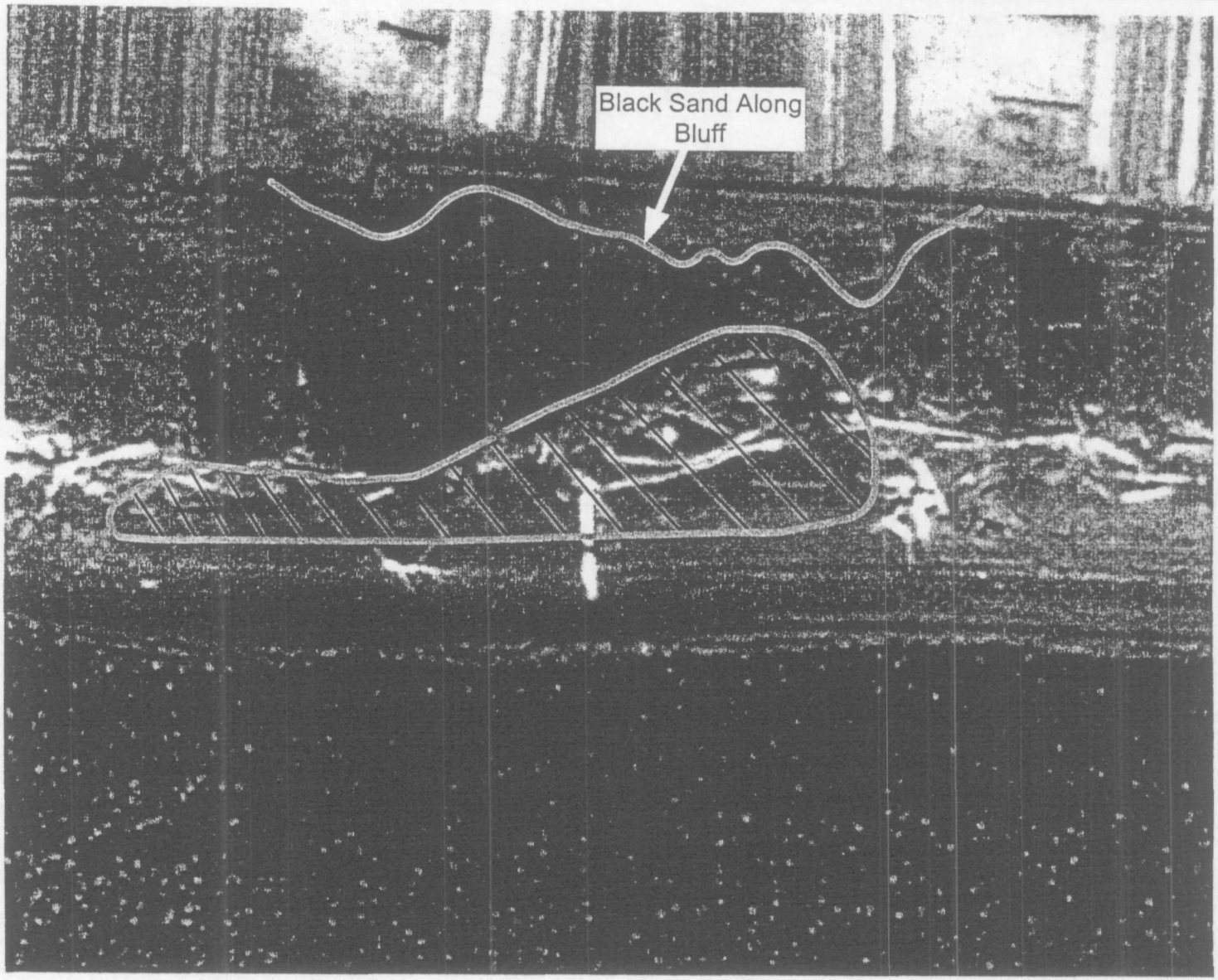


Figure 1
Site Plan
Crawford Street Corporation

BRIDGEWATER GROUP, INC.



N

Approximate Scale

30 feet

Black sand on surface (removal area)
Approximately 1.5 feet deep

Figure 2
Black Sand Removal Area
Crawford Street Corporation

BRIDGEWATER GROUP, INC.